rather than by assuming that it is

$$\mu \pm (\alpha_1 \sin D + \alpha_2 \sin 2D \\ + \beta_1 \cos D + \beta_2 \cos 2D)$$

in which case the inequalities of semidiameter merge into the inequalities of longitude.

My point can also be demonstrated thus. Remove $\pm\mu$ from my formula, and it becomes the most general expression possible for errors periodic in the lunation and free from discontinuity. The proper provision to make for a single discontinuity is to introduce a single additional unknown quantity.

The Coefficient of the Principal Term in the Moon's Latitude.
By P. H. Cowell.

1. The coefficient of sin F in Hansen's tabular latitude transformed to Delaunay's form is	$18461''.65$
2. The mean value of the observed *minus* tabular errors of 5646 observations from 1847 to 1901, each multiplied by 2 sin F, is... ...	$-0''.27 \pm 0.03$
3. The correction to the deduced coefficient, on account of the excess $+0''.11 \sin (F-D)$ $-0''.05 \sin (F+D)$ of Hansen's tables over Brown's coefficients (*Monthly Notices*, vol. lxv. 1905 January), is	-0.03
	18461.35 ± 0.03
4. Estimated correction to reduce to Pulkowa refractions...	0.00 ± 0.02
5. Estimated effect of planetary terms of period nearly equal to that of F	0.00 ± 0.04
Concluded coefficient	18461.35 ± 0.05

In paragraph 2 the accidental error is estimated from the analogous investigations for the longitude.

In paragraph 4 account is taken of the fact that Stone's refractions were used during the years 1868–1877, in which the longitude of the node decreased from 150° to −50°.

In paragraph 5, as the planetary perturbations in latitude have not yet been computed, an estimate of their possible effect was based upon the fact that the maximum effect of the planetary terms upon the principal elliptic inequality as deduced from the observations of any continuous period of fifty-four years is $0''.10$.

Note on Point Distributions on a Sphere, with some Remarks on the Determination of the Apex of the Sun's Motion. By H. C. Plummer, M.A.

1. In several astronomical problems we have to consider the distribution on a sphere of a large number of points which do not appear to be scattered uniformly, but, on the contrary, reveal a tendency, more or less pronounced, towards some great circle on the sphere. An obvious instance is the distribution of the stars in the sky, and the question has been discussed from this point of view by Professor Newcomb in his recent paper "On the Position of the Galactic and other Principal Planes toward which the Stars tend to crowd."* The determination of the position of such a great circle or "plane of condensation" is required in other connexions, the instance quoted being the simplest and most definite illustration.

The stars are represented by n points on a sphere of unit radius. They are supposed to be crowded in the vicinity of a certain great circle, but the divergences cannot be regarded in general as small, and the law of crowding is unknown. Under these circumstances it is necessary to define the plane of condensation, and Professor Newcomb defines it as the plane of that great circle for which the sum of the squares of the sines of the distances of all the stars is a minimum. In other words, if v is the distance of any star from the pole of the great circle, the plane of condensation is such that

$$\Sigma \cos^2 v \text{ is a minimum}$$

Now let a coordinate system of rectangular axes $O\xi\eta\zeta$ be taken at the centre of the sphere, $O\xi$ passing through the pole of the required circle. Then the preceding condition becomes

$$\Sigma\xi^2 \text{ is a minimum}$$

But $$\xi^2+\eta^2+\zeta^2=1$$

Hence $$\Sigma(\eta^2+\zeta^2) \text{ is a maximum}$$

If then we assign unit mass to each of the points on the sphere, the condition in its last form shows that the moment of inertia of the system about $O\xi$ is the greatest possible. Hence the problem is reduced simply to that of finding one of the principal axes of inertia for the system of loaded points on the sphere.

With any system of rectangular axes $Oxyz$ (*e.g.* the equatorial system) let (a, b, c) be the coordinates of any one of the stars, and let

$$A = \Sigma a^2,\ B = \Sigma b^2,\ C = \Sigma c^2,\ F = \Sigma bc,\ G = \Sigma ca,\ H = \Sigma ab$$

* Contributions to Stellar Statistics. First Paper. Washington (1904).